Astrophysical Bulletin 2014 vol.69 N2, pages 198-204

Physical and geometrical parameters of the binary system gliese 150.2

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Abstract

The speckle interferometric binary system Gl 150.2 (HIP17491) is analyzed using atmosphere modeling and dynamical analysis simultaneously. A synthetic spectral energy distribution (SED) for each of the two components of the system is built using Kurucz blanketed models. These SEDs are combined together to form the total flux, which is compared with the observed one in an iterative method to get the best fit. The parameters of the individual components which lead to the best fit are: T eff A = 5350 ± 50 K, T eff B = 4400 ± 50 K, log g A = 4.40 ± 0.05, log g B = 4.68 ± 0.05, R A = 0.95 ± 0.06R ⊙, R B = 0.58 ± 0.06R ⊙, and π = 38.63 ± 0.79 mas, as given by the modified Hipparcos measurement. A modified orbit of the system is introduced and compared with earlier orbits. Hence, the masses of the two components are derived from the coincidence between the atmosphere modeling and dynamical analysis. Based on the estimated physical and geometrical parameters of the system, which are confirmed by synthetic photometry, the spectral types and luminosity classes of the two components are found to be G9.5V and K7V for the primary and secondary stars respectively, with an age of about 8 Gyr. Finally, the positions of both components on the H-R diagram are plotted, and the formation and evolution of the system are discussed. © 2014 Pleiades Publishing, Ltd.

http://dx.doi.org/10.1134/S1990341314020072

Keywords

binaries: visual, stars: fundamental parameters, stars: individual: Gliese 150.2